

EXHIBIT 25

To save paper, Valley Water incorporates by reference all electronic versions of documents contained in:

SUPPLEMENTAL TECHNICAL INFORMATION, SOUTH BELRIDGE OIL FIELD
(STARRH & STARRH COTTON GROWERS TRIAL RELATED DOCUMENTS);
https://geotracker.waterboards.ca.gov/regulators/deliverable_documents/3595714747/Aera%20E_Supplemental_Tech_Info_5-23-2005.pdf; and
https://geotracker.waterboards.ca.gov/profile_report.asp?global_id=L10006221337

as Exhibit 25.

EXHIBIT 26

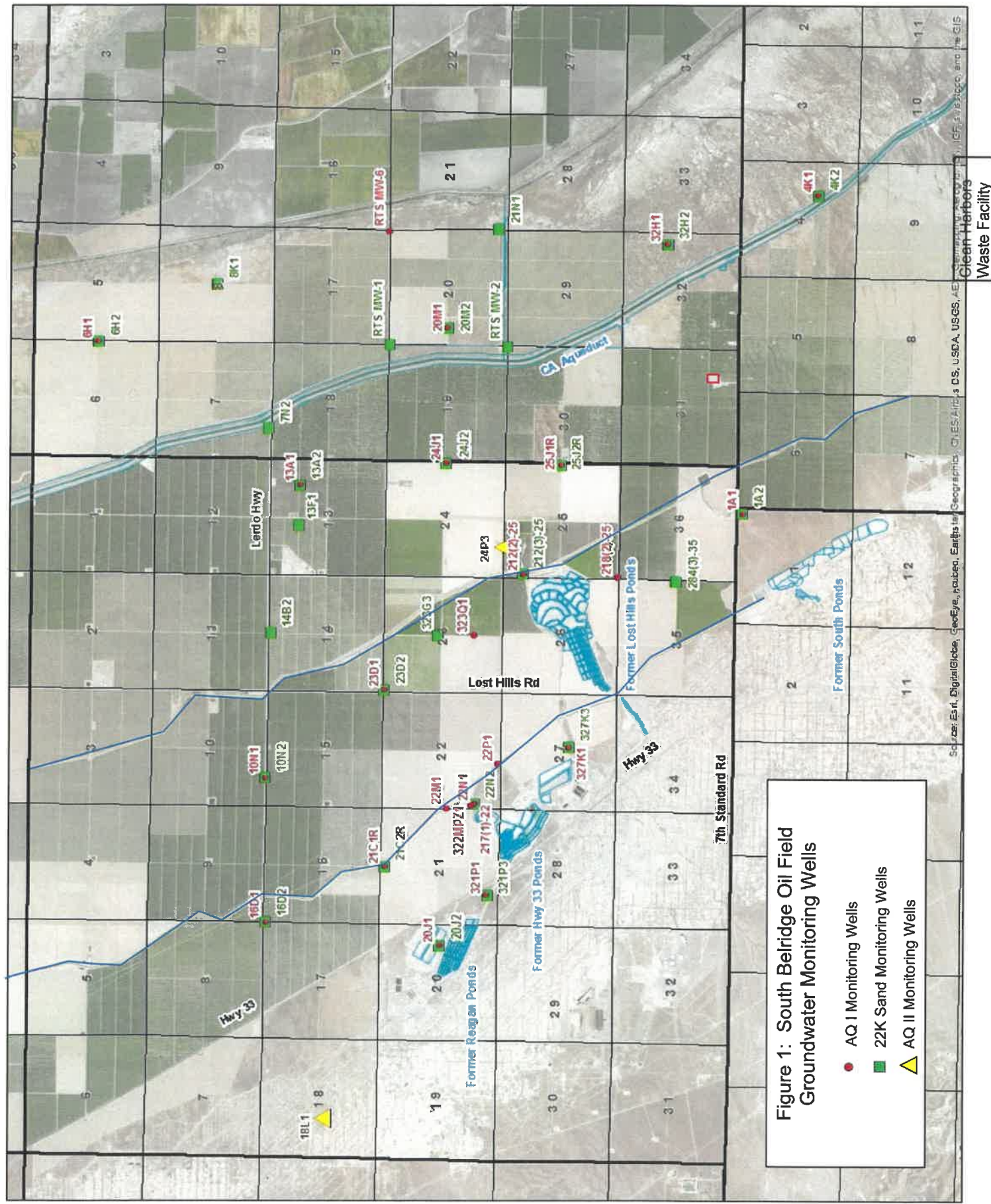


EXHIBIT 27

VALLEY WATER MANAGEMENT COMPANY

7500 MEANY AVE.
BAKERSFIELD, CALIFORNIA 93308

March 9, 2018

Ms. Pamela Creedon, Executive Officer - Pamela.Creedon@waterboards.ca.gov
Mr. Clay Rodgers, Assistant Executive Officer – Clay.Rodgers@waterboards.ca.gov
Central Valley Regional Water Quality Control Board
1685 E Street
Fresno, CA 93706

Re: Response to Regional Board Letter on Proposed Orders Related to Valley Water's McKittrick Facility

Dear Ms. Creedon and Mr. Rodgers,

Valley Water Management Company (Valley Water) submits this letter to provide the data requested in the recent Central Valley Regional Water Quality Control Board (Regional Board) letter dated 1 March 2018 in a timely manner. Valley Water would also like to express its extreme disappointment that this matter is proceeding to a formal adjudicatory hearing on April 5/6 instead of being resolved through a cooperative approach with technical staff to come to agreement on key technical issues that are the basis for all decision making on the site as specified in our February 26 comment letter on the Resolution, and on a permitting and monitoring strategy consistent with the recently adopted oil field General Orders (GOs) and the proposed Salinity Permitting Strategy contained in the Basin Plan amendments being adopted by the Regional Board in just a few months.

Because a hearing has now been set, and because Valley Water anticipates that cross examination of staff will be needed due to a disagreement over the facts being relied upon by Regional Board staff in the proposed Resolution, draft Monitoring and Reporting Program (MRP), and supporting documents, Valley Water requests that 2-3 hours be allocated for Valley Water's presentation, cross-examination, and closing arguments at the upcoming hearing.

I. The Data Does Not Support the Regional Board's Findings

The letter to Valley Water dated 1 March 2018 asked that we respond to three questions regarding our 13 February 2018 letter to Ms. Pamela Creedon and Mr. Clay Rodgers by 9 March 2018. We believe that our February 26, 2018 comment letter on the Resolution completely covers the data requests of Board staff, but we provide the following information below to ensure our response is complete.

The discussion of produced water migration from the Valley Water McKittrick ponds has been explored very thoroughly, including with a draft groundwater model, and the status of that exploration with Board staff has been summarized in the February 13, 2018 letter to Regional Board staff, and in more detail in our comment letter to the Resolution dated February 26, 2018. The remaining technical issue

to resolve with Board staff before completing this phase of the groundwater modeling effort is whether or not produced water from McKittrick is present below the Clean Harbors facility, in what is being called the Upper Perched Zone and the Intermediate Perched Zone. The following three issues provide clarity on this technical issue and the related questions should be resolved between Valley Water and Regional Board staff before bringing the matter before the Regional Board members:

1. **Stratigraphy:** The Upper Alluvium unit beneath McKittrick does not have perched water above the Corcoran Clay Equivalent (CCE), while the stratigraphically-equivalent Upper Zone beneath Clean Harbors does have perched water. Question 1: How can produced water migrate vertically upwards from below the CCE and flow upwards through the CCE to be found in the "Upper Perched Zone" at Clean Harbors?
2. **Chemistry:** The water chemistry shows high levels of constituents, such as nitrate, that are not present in McKittrick's produced water. Question 2: How can a fairly high concentration of nitrate showing up downgradient beneath Clean Harbors, when nitrate is not found at detectable levels in the produced water, and not found beneath the McKittrick facility or in the groundwater monitoring wells at significant concentrations?
3. **Other sources.** Extensively irrigated land sits adjacent to the one location on Clean Harbors' property that has perched groundwater in both the Upper Perched Zone and the Intermediate Perched Zone. Question 3: How can irrigated agriculture not be explored as the cause and effect of the water under Clean Harbors given issues 1 and 2 above?

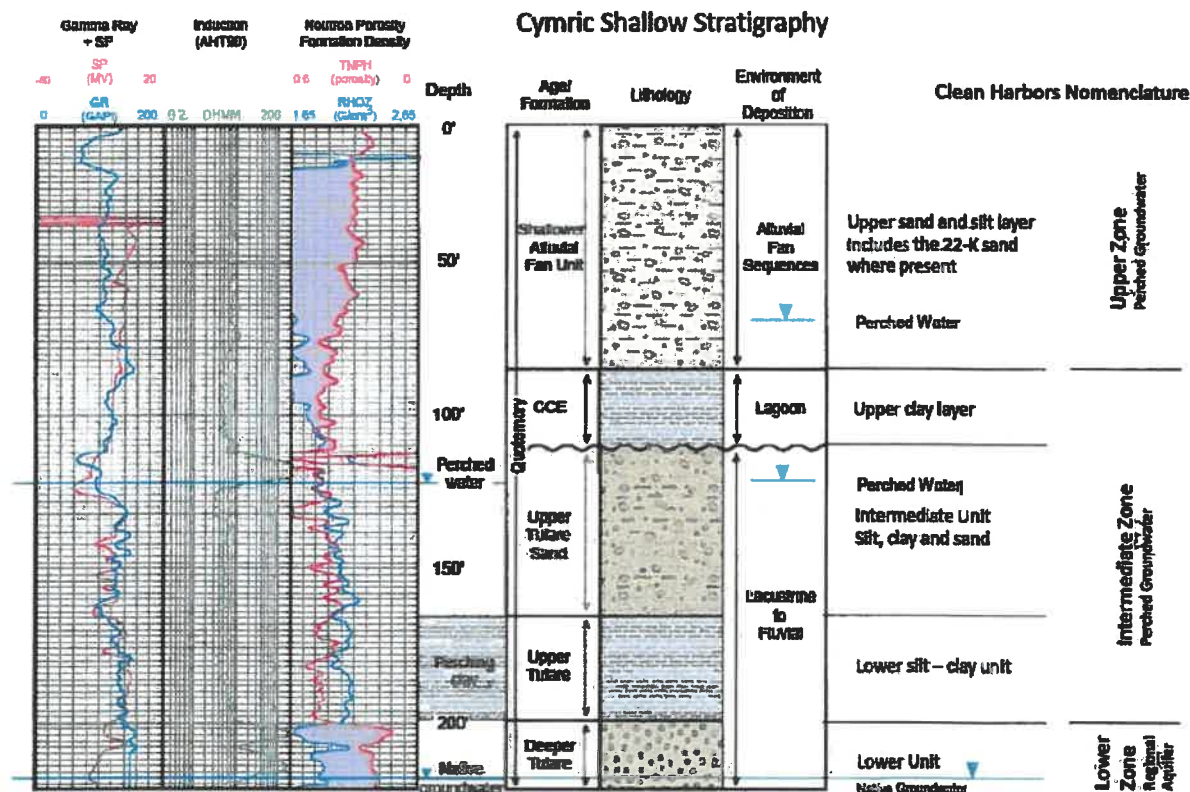
Attached below is a stratigraphic section, developed collaboratively between Valley Water and Regional Board staff, which shows how the stratigraphy beneath the McKittrick facility correlates to the stratigraphy beneath Clean Harbors. Beneath the McKittrick ponds, the Upper Alluvium does not have perched water as the CCE is predominantly silty and, therefore, does not significantly restrict the downward migration of produced water. In contrast, beneath the northwest portion of the Clean Harbors facility, the CCE is more clay-rich and *does* act as a relatively impermeable barrier allowing water to perch beneath the Clean Harbors facility. The Upper Perched Zone under the northwest portion of the Clean Harbors facility is saturated while the Upper Alluvium beneath the McKittrick facility is not saturated.

The source of recharge to the Upper Perched Zone under the northwest portion of the Clean Harbors facility appears to be adjacent agricultural infiltration. No known physical mechanism exists whereby water from McKittrick, which first occurs *beneath* the CCE, could travel downgradient to Clean Harbors, and then migrate upwards *through* the CCE. The water found in the Upper Perched Zone beneath Clean Harbors cannot be from the McKittrick facility (as described above), but does contain nitrate compounds that implicate irrigated water as the potential source of the perched water beneath the Clean Harbors Facility. The fact is, perched water at Clean Harbors is most notably associated with relatively high concentrations of nitrate compounds, and relatively low concentrations of boron; neither of which are typical of produced water, but both are characteristic of percolation from irrigated fields. Taken together, the geochemistry indicates that the limited area of perched water at Clean

Harbors is not impacted by produced water. Rather, perched groundwater appears to be impacted by irrigation in adjacent agricultural fields to the north.

The water found in the Intermediate Perched Zone beneath Clean Harbors resembles that of the Upper Perched Zone and, therefore, is most likely to be Upper Perched Zone water that has slowly seeped through the CCE to perch above the Upper Tulare perching clay/lower silt-clay unit.

In addition, a nagging question remains of water level differences between the monitoring wells owned by Valley Water and the monitoring wells beneath Clean Harbors. Historically, the water levels in the Valley Water monitoring wells have been rising over time. During that same time, water levels in the Clean Harbors monitoring wells have been decreasing. This clearly indicates a disconnect between migrating produced water from McKittrick and the Clean Harbor wells.



II. The Proposed Orders are Contrary to Adopted Regional Board Policies and Orders

A. Proposals are Inconsistent with Intent of Oil Field General Orders

Three GOs were adopted in 2017 that were intended to fit most oil field produced water pond situations in the Central Valley. The Regional Board's "Priority Projects FY 2017-2018" cited "GENERAL ORDER ENROLLMENT" where "Staff will enroll dischargers currently operating under cleanup and abatement orders into one of the three General Orders for Oil Field Discharges to Land" as a priority

for the Regional Board.¹ General Order Number Three (GO3) should apply to the McKittrick facility since that facility meets the following specified requirements for coverage:²

GO3 applies to owners and/or operators of oil and gas production facilities that:

- a. primarily discharge produced wastewater from oil and gas extraction operations to land, including but not limited to produced wastewater disposal ponds, but that may also discharge produced wastewater to land for dust control and for construction activities and may discharge road mix within Facility boundaries to enhance containment berms and roads;
 - b. exceed the maximum oil field discharge salinity limits for electrical conductivity, chloride, and boron contained in the Water Quality Control Plan for the Tulare Lake Basin, Second Edition, Revised January 2015 (Basin Plan);
 - c. discharge where the first encountered groundwater is of poor quality or there is no first encountered groundwater;
 - d. discharge where the first encountered groundwater does not support beneficial uses as identified in the Basin Plan as Municipal and Domestic Supply (MUN), or Agricultural Supply (AGR), or Industrial Service Supply (IND) or Industrial Process Supply (PRO);
- and
- e. began discharge of wastewater to pond(s) prior to 26 November 2014.

The proposed Resolution is contrary to Finding 4 of GO3, which states: "It is the intent of the Central Valley Water Board that Facilities regulated by outdated WDRs [waste discharge requirements] can also apply for coverage under this General Order."

The Resolution is contrary to Finding 21 of GO3 and Chapter III of the Tulare Lake Basin Plan under the section on Water Quality Objectives for groundwater for salinity, which state:

No proven means exist at present that will allow ongoing human activity in the Basin and maintain ground water salinity at current levels throughout the Basin.

GO3 puts permittees under that permit on a path for de-designation of municipal (MUN), agricultural (AGR), and/or industrial supply (IND or PRO) uses. Such de-designation is possible in instances where there is contamination or pollution, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic or agricultural use using either Best Management Practices or best economically achievable treatment practices. See GO3 at Findings 23.b. and 24.a.(both sub-sections). MUN de-designation is also appropriate where "The total dissolved solids (TDS) exceed 3,000 milligrams per liter (mg/L) (5,000 micromhos per centimeter (µmhos/cm) electrical conductivity) and it is not reasonably be expected by the Regional Boards to

¹ See Regional Board website (last accessed on 3/6/2018) on FY 2017/18 Oil Fields Program Fact Sheet at: https://www.waterboards.ca.gov/centralvalley/board_info/exec_officer_reports/program_factsheets/fy1718/fy1718_oilfields_factsheet.pdf

² Apparently, others are also having difficulty using GO3 as the online list of Notices of Applicability shows only one facility with a Notice of Approval under that GO. See Regional Board's oil field page (last accessed 3/6/2018), found at: https://www.waterboards.ca.gov/centralvalley/water_issues/oil_fields/information/disposal_ponds/.

supply a public water system," since these waters were exempt from being designated and should not have been designated in the first place since groundwater exceeded 3,000 mg/L in 1989.³

GO3's Finding 31 recognizes that: "Hydrogeological conditions, particularly in the oil fields on the west side of the Central Valley, have resulted in areas where first encountered groundwater is petroleum or hydrocarbon producing and/or is of such poor quality that it cannot reasonably be expected to be used, now or in the future, for the Basin Plan assigned beneficial uses, even with the implementation of best management practices or best economically achievable treatment practices." (Emphasis added). Finally, Findings 56 and 57 recognize that the CV-SALTS process may "necessitate the re-opening of" GO3, and that exceptions from water quality objectives may be obtainable.

Notwithstanding all of these findings, Regional Board staff has held firm that Valley Water cannot qualify for GO3 and has seemingly pre-judged the ability to qualify for any de-designation decision by disallowing that pathway. Instead of the collaborative GO3 path, Regional Board staff is insisting on a more stringent permit and monitoring program through the proposed Resolution and MRP (notwithstanding the voluntary monitoring and other data available to the Regional Board (see further discussion below)), than anticipated either by the oil field GO program, or the CV-SALTS program. We would appreciate the opportunity to explore the relative merits and requirements of the GO3 path versus the revised WDR path with Regional Board staff, in an expeditious manner, to help come to agreement before bringing the issue to the Regional Board members in April of this year. We believe that during such dialogue Valley Water may better understand Regional Board staff's objectives, and may be able to craft a solution that meets both our needs.

B. Proposals are Inconsistent with Salt and Nitrate Management Plan

One of the key goals of the Salt and Nitrate Management Plan (SNMP) for the Central Valley is to "establish a balance of the mass of salt and nitrate in groundwater underlying each permitted or managed area, where reasonable and feasible. With regards to salt, balance is defined as achieving a state where inputs of salt (salt flux in) into a managed area are equal to outputs (salt flux out) from the same area." See SNMP, *Central Valley Salt and Nitrate Management Strategy* at p. 4-2 (Goal 2)(emphasis added).⁴ As discussed in Section I of this letter, we believe the technical data indicates no imminent threat to usable groundwater posed by the McKittrick Facility, thereby allowing time for further discussion and participation in a more comprehensive solution along with other sources of salinity in the valley.

The SNMP recognized that long-term solutions are needed for addressing salinity. For example, "the Strategic Salt Accumulation Land and Transportation Study (SSALTS) identified and evaluated potential

³ See *inter alia* State Water Resources Control Board Res. 88-63; see also Table 3-9 of Region Board's "*Salt and Nitrate Conditions in Central Valley Region*," showing the shallow groundwater for the Initial Analysis Zone (IAZ) closest to McKittrick exceeded 3,000 mg/L TDS in the decade from 1980-1989.

⁴ See also SNMP at Figure 3-18 and p. 3-22 (showing decrease in mass from IAZ 19 (where McKittrick is located) and greatest outflux of TDS mass due to the vertical flow downward out of the shallow 20-year travel zone component deeper into the aquifer system beneath the IAZ).

salt management strategies (CDM Smith 2013, 2014, and 2016b). The study's findings showed that current salinity management activities may only address about 15% of the annual salt load; long-term solutions, including development of regional de-salters, a regulated brine line, or other projects that would allow containment or removal of salt, are needed to address the other 85%. These long-term management strategies will require significant state and federal funding to implement. In the meantime, the Central Valley Water Board must implement the Basin Plans through the adoption of WDRs/Conditional Waivers that consider the beneficial uses to be protected and the water quality objectives associated with those beneficial uses." SNMP at p. 4-6.

Because the solutions for addressing salinity are decidedly long-term in nature, the Central Valley Water Board needs be able to consider innovative salt management strategies for both the short term and the long term that move the region toward salt balance and restoration of impacted areas, where reasonable and feasible. This includes needing additional regulatory flexibility with respect to the issuance of WDRs/Conditional Waivers with salinity-related requirements, including the use of exceptions, potential classification of AGR uses, offsets, drought and conservation policies, and the adoption of a proposed Interim Salinity Permitting Strategy for salinity discharges during implementation of the Salinity Management Strategy. *Id.* at pp. 4-6 to 4-15; p. 4-52.

The First Phase of the Salinity Management Strategy is anticipated to consist of developing a Prioritization and Optimization Study (P&O Study) for salinity management for the entirety of the Central Valley Region in lieu of conservative regulatory programs as is being proposed for Valley Water in the draft orders. As an active participant in CV-SALTS for many years, Valley Water was led to believe that participation in the P&O Study would be the main compliance activity during Phase I, not harsher requirements as proposed in these orders.

The SNMP determined that "[i]t is reasonable to employ a long-term interim permitting approach." SNMP at p. 4-55. Because of the long-term nature and anticipated high costs for implementation of the Salinity Management Strategy, the SNMP also found that it is reasonable to expect that dischargers will not be able to implement such strategies individually, but will need to participate in a larger region-wide collective effort. SNMP at p. 4-55. Due to the anticipated costs of these efforts, the SNMP determined "it is appropriate that discharges not be subject to extensive and/or expensive salinity permit requirements during this interim period. In particular, individual discharge efforts would have little impact on Central Valley salinity management as a whole, and as such they are not reasonable, feasible or practicable." SNMP at 5-55 to 4-56 (emphasis added). The proposed Resolution and MRP are inconsistent with the policies promoted in the SNMP and urged throughout the CV-SALTS process.⁵

⁵ See also SNMP Section 4.3.3.5 - Process for Development and Adoption of Resolutions/Orders to Implement Interim Permitting Approach, which urges the Regional Board to "prepare the appropriate resolutions/orders that amend the salinity provisions in existing permits and that establish such provisions for future permits,.... It is recommended that such resolutions be prepared and ready for Central Valley Water Board consideration within one (1) year of the Basin Plan amendments adopted to facilitate implementation of this SNMP becoming effective. In the meantime, while such resolutions are being developed, CV-SALTS recommends that the Central Valley Water Board permit

III. The Proposed MRP Includes Excessive and Expensive Monitoring

As previously indicated, Valley Water has voluntarily installed monitoring wells and has been monitoring for years at the McKittrick site. Current costs for that monitoring run approximately \$25,000 per year with two samples taken annually. The costs for the new proposed MRP will add at least \$100,000 annually for monitoring and reporting costs to over \$125,000 a year, just for this site, and Valley Water has many additional sites. The burden, including costs, are unreasonable and do not bear a reasonable relationship to the need for or benefits obtained from this additional data. Cal. Water Code §13267(b), §13225(c), and §13000.

The proposed MRP contains numerous constituents that routinely result in Non-Detectable (ND) values, which should be removed from the routine sampling list. When we discussed this with Regional Board staff, the answer was that staff planned to adopt this MRP “as is” and that Valley Water can request removal of constituents later. That seems to be a backwards approach, so we are providing justification for removal of constituents or reduction in sampling events now, so these requests can be considered and hopefully implemented, assuming the Regional Board feels the need to adopt an MRP for McKittrick now before an updated permit can be associated with that MRP (i.e., either GO3 or a new individual WDR based on the new Salinity Permitting Strategy adopted pursuant to CV-SALTS process).

A. Valley Water Requests a Reduction in Sampling Parameters

Since the produced water at the McKittrick site has been fully characterized previously under the 13267 Order in 2015, and to reduce costs for continually sampling constituents that are unlikely to be present in detectable or significant amounts (see data submitted to Regional Board for 13267 and routine monitoring at McKittrick, which are hereby incorporated by reference) or that have not been found in local groundwater, Valley Water requests that the following constituents be removed from the MRP:

- All metals (except potentially arsenic and barium)
- All PAHs
- BTEX
- All radionuclides
- Nitrate
- Carbonate
- Trace Elements

The SNMP also encourages monitoring for salinity in surface and groundwater as part of existing monitoring programs, or through regional monitoring programs as appropriate, which should be coordinated with the surveillance and monitoring program established to support implementation of adopted Basin Plan amendments to facilitate SNMP implementation (see SNMP Section 5). Thus, for

salinity discharges in a reasonable manner that looks forward towards implementing the Salinity Management Strategy as set forth in the SNMP.” (Emphasis added.)

salinity, individual monitoring for all constituents of salinity was not anticipated as a more regional approach was desired and recommended.

B. Valley Water Requests a Reduction in Required Sampling Events

The State Water Board has encouraged Regional Board permit writers to review available monitoring data to identify any areas where monitoring frequency could be reduced. *See accord* SWRCB RESOLUTION NO. 2013-0029. Instead of requiring quarterly monitoring, the MRP should require bi-annual or annual monitoring to ensure that the quality of the water has not changed dramatically, but at a reduced cost.

In closing, Valley Water once again reiterates our position that bringing this matter before the Regional Board members in an adjudicatory hearing appears to be premature and inconsistent with resolving technical issues in a transparent and collaborative manner, and with the intent of the General Order and CV-SALTs processes. Valley Water believes that it should qualify for GO3, or alternatively, once the Salinity Permitting Strategy is adopted by the Regional Board in late May, an update of the Waste Discharge Requirements at the McKittrick facility could be drafted to include the same reasonable interim salinity management approach that will be applicable to all other discharges of salinity in the Central Valley. We believe that further discussion with Regional Board staff regarding this regulatory pathway, or the pathway of revising the WDR, could also best be resolved in a collaborative manner before bringing any remaining issues before the Regional Board.

Sincerely,

JONATHAN C. FISCH
OPERATIONS MANAGER
FOR



Russell Emerson
Manager, Valley Water Management Company

cc: Patrick Pulupa, CVRWQCB (Patrick.Pulupa@waterboards.ca.gov)
Melissa Thorne, Downey Brand LLP (mthorne@downeybrand.com)
Jean Pledger, VWMC General Counsel (JPledger@eplawyers.net)
Jim Waldron (jimwaldron79@gmail.com)

EXHIBIT 28

From: Jason Meadors <jmeadors@valleywatermanagement.org>
Sent: Friday, April 12, 2019 3:17 PM
To: Lopez, Alejandra@Waterboards
Cc: Rodgers, Clay@Waterboards; Christopher Reedy; Jim Waldron
Subject: Valley Water - McKittrick Facility Update - April 2019

Dear Alejandra,

This email will serve as the monthly status update for April 2019, as required in the Section 13267 Order Letter that your office sent Valley Water in September 2018.

During past month, Valley Water has been coordinating biological surveys and small mammal trappings, which were completed by McCormick Biological were completed at two proposed monitoring well locations on Chevron's property, located north of Lokern Road. McCormick also performed a biological survey and small mammal trapping survey on a property on the south side of Lokern Road, located on Houchin's property. As discussed in our last monthly report, due to the extremely rainy weather this winter, we had to find a five day window between rain events to perform the required small mammal trapping surveys. We are now waiting for the final survey reports from McCormick to determine if it will be feasible to drill wells on these sites in the near future. If the reports determine that the sites are clear to drill the wells, then we will send you a map showing the final proposed sites for review by Clay Rodgers. Also, once we have the final survey reports and have the final proposed sites reviewed by Clay Rodgers, then we will be able to finalize the agreements with Chevron and Houchin to construct the wells. We would like to begin drilling these wells by May 2019.

Also, as mentioned in our update last month, we have scheduled Blunt Nosed Leopard Lizard surveys for April for an additional potential well location in the middle of the Chevron property, which is in an area that is heavily vegetated and has not been previously disturbed. This well may be necessary and we wanted to be proactive on conducting the BNLL survey for this location. We plan on having this well drilled around September 2019 after the BNLL surveys have been conducted.

Another proposed monitoring well location is up-dip of our facility and is located on previously disturbed soil. We are working to secure access from the property owner and plan on having the well drilled around September 2019.

As you are aware, Valley is very interested in getting these wells installed so that we can acquire the required data to identify the extent of the Valley Water discharge.

Please let me know if you have any questions.

Thank you,

Jason L. Meadors, PE
General Manager
Valley Water Management Company
7500 Meany Ave
Bakersfield, CA 93308
Tel. 661-410-7500
jmeadors@valleywatermanagement.org

EXHIBIT 29

Central Valley Regional Water Quality Control Board

27 July 2018

Russell Emerson, Manager
Valley Water Management Company
7500 Meany Ave
Bakersfield, CA 93308

DOCUMENT REVIEW, MONITORING WELL INSTALLATION AND SAMPLING PLAN, MCKITTRICK 1 & 1-3 FACILITY, KERN COUNTY

The Central Valley Regional Water Quality Control Board (Central Valley Water Board) received a Monitoring Well Installation and Sampling Plan (MWISP) dated 4 June 2018, and titled *"Monitoring Well Installation and Sampling Plan for the Valley Water Management Company McKittrick Ponds Facility, Cymric Oil Field"*, for the McKittrick 1 & 1-3 Facility (Facility) in Kern County. The MWISP was prepared by Kennedy/Jenks Consultants on behalf of Valley Water. Valley Water submitted the MWISP in response to the requirements of Monitoring and Reporting Program Order R5-2018-0808.

Central Valley Water Board staff (Staff) has reviewed the MWISP and our comments are presented in the enclosed memorandum. The MWISP proposes the installation of six additional monitoring wells to extend the existing groundwater monitoring network and delineate the plume of produced wastewater emanating from the Facility ponds. Given the complex hydrogeology of the site, and the extent of the wastewater constituent plume, the number of proposed monitoring wells that would be added to the six existing wells seems to be inadequate to define the lateral and vertical extent of wastewater constituents in the groundwater. However, Valley Water can proceed with the proposed MWISP, provided that the following recommendations are incorporated into the MWISP:

- Proposed monitoring well CYM-17A1 is installed whether or not well CYM-17H1 is completed in unsaturated sediments;
- All new monitoring wells are logged using geophysical methods; and
- The process for determining the screened interval for a well is included in the MWISP.

By 27 August 2018, Valley Water needs to submit a revised MWISP addressing the above-mentioned staff comments and recommendations. Valley Water should proceed immediately with the installation of the proposed wells while it is preparing the revised MWISP.

Valley Water Management Company
McKittrick 1 & 1-3 Facility
Kern County

- 2 -

27 July 2018

If you have any questions, please contact Alejandra Lopez of this office at (559) 445- 6071 or via e-mail at Alejandra.Lopez@waterboards.ca.gov

Clay L. Rodgers

for Patrick Pulupa
Executive Officer

Enclosure: 27 July 2018 Memorandum

cc: Bill Bartling, California Division of Oil, Gas, and Geothermal Resources,
Bakerfield (via email)
Jim Waldron, Valley Water Management Company, 2303 Via Clavel, San Clemente
(via email)
Hollin Kretzmann, Center for Biological Diversity, San Francisco (via email)
Andrew Grinberg, Clean Water Action, Oakland (via email)



EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIGUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Central Valley Regional Water Quality Control Board

TO: Ronald E. Holcomb
Senior Engineering Geologist
PG No. 6725

FROM: Alejandra Lopez
Engineering Geologist

DATE: 27 July 2018

SUBJECT: DOCUMENT REVIEW, MONITORING WELL INSTALLATION AND SAMPLING PLAN, MCKITTRICK 1 & 1-3 FACILITY, KERN COUNTY

A Monitoring Well Installation and Sampling Plan (MWISP) for the McKittrick 1 & 1-3 Facility (Facility) was submitted by Valley Water Management Company (Valley Water) via the GeoTracker database on 4 June 2018. The MWISP, titled *Monitoring Well Installation and Sampling Plan for the Valley Water Management Company McKittrick Ponds Facility, Cymric Oil Field, California* and dated 4 June 2018, was prepared by Kennedy/Jenks Consultants on behalf of the Valley Water. The MWISP was prepared in response to Monitoring and Reporting Program Order No. R5-2018-0808 (MRP), which was issued by the Central Valley Regional Water Quality Control Board (Central Valley Water Board) on 4 April 2018.

BACKGROUND

Valley Water owns and operates the Facility which is located in Section 19, Township 29S, Range 22E, Mount Diablo Base and Meridian (MDB&M), in Kern County. The Facility consists of two side-by-side, interconnected pond systems which have been used for the disposal of produced wastewater via evaporation and percolation since the late 1950s. The McKittrick 1 pond system occupies the west side of the Facility and is slightly higher in elevation than the McKittrick 1-3 pond system that occupies the east side of the Facility. At the McKittrick 1 pond system, incoming wastewater is discharged into six netted oil and water cleaning ponds, eight pass-through ponds, and 14 evaporation and percolation ponds. Pipelines that discharge into the cleaning ponds are owned and operated by California Resources Corporation (CRC) and Sentinel Peak Resources California LLC (SPR). At the McKittrick 1-3 pond system, incoming wastewater is discharged into three netted oil and water cleaning ponds, 23 pass-through ponds, and 29 evaporation and percolation ponds. The pipeline that discharges into the McKittrick 1-3 cleaning ponds is owned and operated by SPR.

Wastewater can gravity flow from the first two McKittrick 1 evaporation and percolation ponds to 11 evaporation and percolation ponds in the McKittrick 1-3 system. For both pond systems, wastewater usually flows through their respective evaporation and percolation ponds in parallel. However, the pass-through ponds adjacent to the larger evaporation and percolation ponds can control the flow into the evaporation and percolation ponds. Therefore, each evaporation and percolation pond in each pond system can be operated independently or jointly in series.

KARL E. LONGLEY ScD, P.E., CHAIR | PATRICK PULUPA, ESQ., EXECUTIVE OFFICER

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The current produced wastewater volume discharged to the Facility is approximately 58,000 barrels per day. Produced wastewater discharged to the Facility percolates and has produced a saline water mound emanating from the disposal ponds. The Facility has an existing groundwater monitoring network comprised of six monitoring wells located east-northeast of the Facility. Previously provided groundwater quality data indicates that the wastewater plume has extended beyond all Valley Water's monitoring wells and additional monitoring wells are required. The Clean Harbors Class I Landfill Facility (Clean Harbors) is hydraulically downgradient of the McKittrick 1 & 1-3 Facility ponds.

Regional Well Survey

The MWISP has an aerial map of wells within 1, 2.5, and 10 miles downgradient of the McKittrick 1 & 1-3 ponds. No water supply wells were identified within a one-mile radius of the Facility. Six irrigation water supply wells belonging to Starrh farms were identified within approximately 2.5 miles of the Facility. These wells will not be sampled because they are outside the required one-mile radius sampling zone. Downgradient of the Facility and within approximately 10 miles, 18 irrigation water supply wells were identified.

Hydrogeology

The MWISP briefly describes the local hydrogeology. Two cross sections and a generalized description of local stratigraphy were provided. These cross sections show the generalized stratigraphy of the area and the approximate depth to groundwater. In addition to the cross sections, a generalized description of the stratigraphic relationships between Valley Water and Clean Harbors is included.

In 2002, two monitoring wells (CYM-19H1 and CYM-17M1) were installed to monitor the Upper Tulare Sands beneath the Corcoran Clay Equivalent (CCE) and above the Upper Tulare Clay (UTC). One monitoring well (CYM-21D1) was installed to monitor the Lower Tulare Sands below the UTC, which is the regional aquifer. Groundwater encountered below the CCE and above the UTC near the McKittrick 1 & 1-3 ponds has water quality similar to produced water discharged from the ponds. The produced wastewater percolates through the CCE, is perched above the UTC, and moves to the northeast along the dip of sediments through the Upper Tulare sands. In 2006, monitoring wells CYM-17Q1, CYM-17M1, and CYM 17K1 were installed downgradient of CYM-19H1 and CYM-17M1 and screened above the UTC to act as sentinel wells. Valley Water sampled the three sentinel wells for the first time in May 2014, and reported that produced water had not been encountered in these wells before that time. Valley Water estimates the gradient in the upper Tulare sand zone to be 105 feet per mile.

Catalyst Environmental Solutions, using a computer model to analyze the movement of moisture through the vadose zone, predicted that produced water in the upper Tulare sands zone would move relatively slowly, about 100 feet per year. The modeling analysis also predicts that the historical produced wastewater discharges to the McKittrick Ponds could be contained in the vadose zone. The MWISP states that, evaluation of the data collected with the proposed new monitoring wells is necessary to validate the modeling results.

Beginning with the third quarter 2018, water samples will be collected in accordance with the 2018 MRP. Figure 1 shows the location of seven Clean Harbors monitoring wells that will be

included in the groundwater monitoring program for Valley Water. Table 1 shows Clean Harbors monitoring well construction details.

Area Biological Assessment

Proposed monitoring well locations are tentative and may be moved based on a future habitat survey evaluation by a biologist. All locations are within the Kern Water Bank Master Permit Zone where credits could possibly be purchased to compensate for incidental take. Due to the confirmed presence of federally listed endangered species, this process may take a long time and, if the Blunt Nose Leopard Lizard is found in the area, then no incidental take will be allowed and access for drilling will not be granted.

WELL INSTALLATION AND SAMPLING PLAN SUMMARY

Installation of Monitoring Wells

The monitoring well installation program will include constructing four to five additional wells with five-inch casings. Borings for shallow monitoring wells will be drilled with mud-rotary drilling equipment. Shallow borings will be drilled to a depth of 100 feet into saturated sediment or ten feet below the top of the UTC. Borings for deep monitoring wells will be drilled using air rotary drilling equipment and will be continuously cored from ground surface to first-encountered groundwater. Deeper monitoring wells will be drilled 40 feet into saturated sediments in the Lower Tulare Sands for well installation. Groundwater samples will be collected from boreholes at first encountered groundwater and analyzed for the parameters listed in Table II of the MRP. Core samples will be collected from specific depths in each boring. Monitoring wells that are completed above the UTC will monitor first encountered groundwater in the Upper Tulare Sand zone. Monitoring wells that are completed below the UTC will monitor the regional aquifer or Lower Tulare Sands. Table 2 shows estimated drilling depths for proposed wells and Figure 1 shows proposed locations.

One shallow monitoring well, CYM-21D2, will be drilled on the same pad as existing well CYM-21D1, if feasible, and will be completed in first encountered groundwater, if any, above the UTC and will serve as a sentinel well if no groundwater is encountered. Monitoring wells CYM-17H1 and CYM-17H2 will be installed approximately half-way between existing Valley Water monitoring wells and Clean Harbors monitoring wells. Monitoring well CYM-17H1 will be screened in the Upper Tulare Sands and monitoring well CYM-17H2 will be screened below the UTC in the regional aquifer. These two wells will be installed on the same well pad. Monitoring well CYM-17A1 will be installed upgradient of Clean Harbors and will be the furthest downgradient monitoring well owned by Valley Water. If neighboring monitoring well CYM-17H1 is completed in Upper Tulare Sands saturated sediments, then CYM-17A1 will also be completed in the Upper Tulare Sands. However, if CYM-17H1 is completed in dry sediments, then CYM-17A1 will not be installed. Monitoring well CYM-25B1 will be southwest of the McKittrick 1 & 1-3 ponds, south-southeast and cross gradient of the McKittrick 1-1 ponds, and will be completed in the regional aquifer. CYM-25B1 will be the only upgradient monitoring well. According to groundwater infiltration modeling done by Catalyst Environmental Solutions, monitoring well CYM-25B1 would be located outside of the estimated wastewater plume emanating from the ponds. Valley Water does not propose to install upgradient groundwater monitoring wells to monitor the Upper Tulare Sand zone.

Soil Sample Collection

Soil cores from deeper monitoring wells CYM-17H2 and CYM-25B1 will be retrieved in 5-foot barrels and will be preserved in marked core boxes for additional analyses, if warranted. Borings from monitoring wells CYM-21D2, CYM-17H1, and CYM-17A1 will not be cored, but cuttings will be retained and logged. Soil samples will be collected from each borehole at 10-foot intervals. Samples will be retrieved as the drilling mud is discharged into the mud pit. Samples will be washed, described by the field geologist, and a borehole log of the sample descriptions will be completed for each borehole. Select samples representative of the lithologies present in the borehole will be stored for further description and interpretation. The borings will be logged and documented under the supervision of a professional geologist or engineer.

Geophysical Logging

Geophysical logs will be generated for the deep boreholes for monitoring wells CYM-17H2 and CYM-25B1. Open hole logging runs at each location will be performed in two stages. The shallow zone will be logged first, down to the depth of the top of the UTC. Once protective surface casing has been cemented into place, drilling will continue to total depth. A second geophysical open hole logging run will be performed to capture the deeper section of the borehole. Resistivity, spontaneous potential, natural gamma ray, caliper, bulk density, neutron porosity, and acoustic logs will be obtained. Log curves will be used to identify lithologies, the presence of groundwater, aquifer-like zones capable of transmitting groundwater, potential aquitards and to select the appropriate screened interval for each monitoring well. These logs will also be used to correlate the shallow stratigraphy with the available well logs in the study area.

Well Installation

Shallow monitoring wells CYM-21D2, CYM-17H1, and CYM-17A1, will be completed across the water table and screened up to 60 feet. Deep monitoring wells CYM-25B1 and CYM-17H2, will be drilled 40 feet into saturated Lower Tulare Sands and will be constructed with at least 20 feet of screen. All monitoring wells will be constructed with 5-inch diameter, polyvinyl chloride (PVC) casing and will contain 0.02-inch slotted screens. The screens of all monitoring wells will approximately straddle the water table in the targeted zone to allow for groundwater fluctuations. Monitoring well filter packs will extend from total depth to 5 feet above the top of the well screen. For wells targeting the regional aquifer zone, the filter pack will not extend into the UTC confining layer. New monitoring wells will be constructed on a 4-foot by 4-foot concrete pad and will sit in a protective locking steel standpipe lock over the PVC casing.

State of California monitoring well standards from Bulletin 74-90 (California DWR, 1991) will be strictly followed during well construction and development.

Well Development

Not less than 48 hours after well completion, the monitoring wells will be developed using a combination of bailing, swabbing and pumping (by airlift and submersible pump, if sufficient groundwater is present) to remove drilling mud and fine-grained material from the well screen

and filter pack. During well development, field parameters including pH, temperature, and specific conductance (EC) will be monitored and recorded. Monitoring wells will not be considered fully developed until the field parameters from three consecutive measurements stabilize as follows: temperature is within ± 1 degree Celsius ($^{\circ}\text{C}$), pH is within $\pm 5\%$ of the previously measured value, and EC is within $\pm 5\%$ of the previously measured value. Monitoring wells that sustain an adequate groundwater flow will be developed until turbidity reaches five nephelometric turbidity units (ntu), or until 10 wet casing volumes have been purged, whichever is first.

Monitoring Wells Groundwater Sampling and Analysis

Groundwater sampling procedures and protocols followed during previous Cymric studies will be followed for this investigation. After the monitoring wells have been properly developed and allowed to recharge, representative groundwater samples will be collected using a submersible pump or bailer after purging a minimum of three casing volumes.

Static water levels and total well depths will be measured during the sampling event. Each sample will be properly labeled to document well number, date, time, and sampler. Samples will be stored in an insulated container at 0 to 6°C . The containers will be transported under appropriate chain of custody to state-certified laboratories. The chains of custody will be provided by the analytical laboratory and will contain the proper identification, sample date, matrix, and analysis to be completed for each sample. State accepted groundwater sampling procedures, which are currently in use at the site, will continue to be followed.

Water levels and samples will also be collected from the McKittrick 1 & 1-3 ponds and the six existing groundwater monitoring wells at the site during this investigation and analyzed for the constituents listed in the 2018 issued MRP.

COMMENTS

The MWISP proposes different lengths for the screened intervals of the wells completed above the UTC and the wells to be completed below the UTC. Also, geophysical logs are proposed for the deeper wells, but not the shallow wells. Valley water needs to provide justification for how the screened intervals are determined. Given the complex hydrogeology of the site, and the extent of the wastewater constituent plume, all proposed monitoring wells need to be logged using geophysical methods.

The MWISP proposes installation of monitoring well CYM-17A1 as an option depending on whether monitoring well CYM-17H1 is completed in saturated or unsaturated sediments. The area affected by the percolation of wastewater covers more than seven square miles and involves at least two distinct saturated zones. The number of proposed monitoring wells that would be added to the six existing wells seems to be inadequate to define the lateral and vertical extent of wastewater constituents in the groundwater. Proposed monitoring well CYM-17A1 needs to be constructed whether or not well CYM-17H1 is completed in unsaturated sediments. Also, additional monitoring wells may be required if the waste constituents in the groundwater are not adequately characterized.

CONCLUSIONS AND RECOMMENDATIONS

Valley Water should proceed, provided that the following recommendations are incorporated into the MWISP:

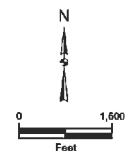
- Proposed monitoring well CYM-17A1 is installed whether or not well CYM-17H1 is completed in unsaturated sediments;
- All new monitoring wells are logged using geophysical methods; and
- The process for determining the screened interval for a well is included in an addendum to the MWISP.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend:

- Existing Valley Water Management Company Well (Upper Tulare Clay)
- Existing Valley Water Management Company Well (Lower Tulare Sands)
- Proposed Valley Water Shallow Well Location
- Proposed Valley Water Deep Well Location
- Clean Harbors Well (Alluvial Fan Upper Perched Zone)
- Clean Harbors Well (Upper Tulare Intermediate Perched Zone)
- Clean Harbors Well (Lower Tulare Water Table Zone)



Kennedy/Jenks Consultants

Valley Water Management Company
McKittrick Ponds Facility
Kern County, California

Proposed Well Location Map

KJJ 1305027*02
June 2018

Figure 1

Table 1: Monitoring Well Construction Details

Well ID	Date Completed	Surface Elevation (ft amsl)	Total Depth (feet bgs)	5" PVC Casing Elevation (ft amsl)	Screened Interval (ft bgs)	Well Construction Material	Stratigraphic Unit ^(b)
Valley Water Monitoring Wells^(a)							
CYM-17K1	8/16/2006	427.9	210	430.9	150 - 200	5-Inch Sch 80 PVC 0.020 slot screen	Upper Tulare Sand (UTS)
CYM-17M1	9/8/2006	446.5	197	449.5	155 - 185	5-Inch Sch 80 PVC 0.020 slot screen	Upper Tulare Sand (UTS)
CYM-17Q1	8/23/2006	437.6	208	440.6	160 - 200	5-Inch Sch 80 PVC 0.020 slot screen	Upper Tulare Sand (UTS)
CYM-17N1	11/22/2002	451.5	240	452.9	105 - 165	5-Inch Sch 80 PVC 0.020 slot screen	Upper Tulare Sand (UTS)
CYM-19H1	11/9/2002	469.2	245	471.2	115 - 155	5-Inch Sch 80 PVC 0.020 slot screen	Upper Tulare Sand (UTS)
CYM-21D1	11/19/2002	427.1	300	429.1	274 - 294	5-Inch Sch 80 PVC 0.020 slot screen	Lower Tulare Sands (LTS)
Clean Harbors Monitoring Wells^(c)							
MW-130U	1987	NA	139	362.31	119-139	-	Alluvial Fan Upper Perched Zone (Above UTS), dry as of 2016
MW-143U	1990	NA	142	359.72	122-142	-	Alluvial Fan Upper Perched Zone (Above UTS)
MW148-I	1990	358.7	188	360.04	171-186	-	Upper Tulare Intermediate Perched Zone (UTS)
MW-149RI	1991	346.2	223	348.01	206-221	-	Upper Tulare Intermediate Perched Zone (UTS)
MW-102RL	-	NA	303	407.50	273-303	-	Lower Tulare Lower Water Table Zone (LTS)
MW-170L	1996	NA	317	414.29	287-317	-	Lower Tulare Lower Water Table Zone (LTS)
MW-PRL	2010	NA	370	359.57	256-286	-	Lower Tulare Lower Water Table Zone (LTS)

Notes:

(a) Source: Geomega. 2007. Phase II Hydrogeologic Characterization Report: Valley Waste Disposal Company, Cymric Field Study Area.

Submitted to the Central Valley Regional Water Quality Control Board, Fresno, California.

(b) Figures 3 and 5 show the correlation between Valley Water and Clean Harbors nomenclature.

(c) Source: WSP, 2018. Cymric Area Sampling and Analysis Report, Second Semi-Annual 2017, Valley Water Management Company. 5 March 2018.

ft amsl = feet above mean sea level

bgs = below ground surface

PVC = polyvinyl chloride

Monitoring Well Installation and Sampling Plan,

Valley Water Management Company, McKittrick Ponds Facility

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Modified by Central Valley Water Board 18 June 2018

Table 2: Approximate Drilling Depths for Proposed Wells

Well ID	Ground Surface Elevation (ft amsl) ^(a)	Depth to UTC ^(b) (feet bgs) ^(c)	Estimated Depth to Groundwater (feet bgs)	Total Depth of Well (feet bgs)
CYM-21D2	427	200	278	200
CYM-17H1	400	205	265	205
CYM-17H2 Deep	400	205	265	305
CYM-17A1	379	200	270	200
CYM-25B1 Deep	550	245	312	352

Notes:

(a) ft amsl =feet above mean sea level

(b) UTC = Upper Tulare Clay

(c) feet bgs = Feet below ground surface

If neighboring CYM-17H1 is completed as a dry sentinel well, then CYM-17A1 will not be installed now.

Monitoring Well Installation and Sampling Plan,

Valley Water Management Company, McKittrick Ponds Facility

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Modified by Central Valley Water Board 18 June 2018

EXHIBIT 30

From: Jason Meadors <jmeadors@valleywatermanagement.org>
Sent: Friday, May 10, 2019 4:31 PM
To: Lopez, Alejandra@Waterboards
Cc: Rodgers, Clay@Waterboards; Christopher Reedy; Jim Waldron
Subject: Valley Water - McKittrick Facility Update - May 2019

Dear Alejandra,

This email will serve as the monthly status update for May 2019, as **required** in the Section 13267 Order Letter that your office sent Valley Water in September 2018.

On May 3, 2019, Valley Water received the trapping results for the Cymric Water Monitoring Well Network Expansion Project from McCormick Biological. These trappings were completed for CYM-20A1, CYM-17E1, and CYM-8R. Two proposed monitoring well locations on Chevron's property, located north of Lokern Road (CYM-17E1 and CYM-8R). McCormick also performed a biological survey and small mammal trapping survey on a property on the south side of Lokern Road, located on Houchin's property (CYM-20A1). On April 16, 2019 we sent you the kmz files showing all five of the proposed well locations. As we discussed via email, our consultant was working on the well designs and acquiring bids to drill the first five wells at the locations stated above in this email. On May 7, 2019 we sent you a memorandum discussing the proposed drilling locations for the first five wells, and then on the same day we had a conference call with you and your staff and discussed the well locations and other items.

Now that we have the locations and well depths determined, and the trapping results have been obtained, we can now finalize agreements with Chevron and Houchin to construct the wells. **Our goal** is to begin construction of these wells during May 2019. Golder and Associates is currently working on the permitting of the wells, as well as the CEQA.

Also, during the month of April, we initiated Blunt Nosed Leopard Lizard surveys for the additional well location (listed in the Golder memo as "Future Proposed Location") in the middle of the Chevron owned property, which is in an area that is heavily vegetated and has not been previously disturbed. We plan on having this well drilled around September 2019 after the BNLL surveys have been conducted.

Another proposed monitoring well location is up-dip of our facility and is located on **previously** disturbed soil. We are continuing to investigate this location and work with the property **owner** to **secure** access, and plan on having the well drilled around September 2019.

As you can see, we are making great progress on the installation of these wells. We look forward to working closely with the CVRWQCB to keep these important activities moving forward.

Please let me know if you have any questions.

Thank you,

Jason L. Meadors, PE
General Manager
Valley Water Management Company
7500 Meany Ave
Bakersfield, CA 93308